

RED/CYAN FILTERS FOR VIEWING 3D PHOTOS PRINTED ON HOME COMPUTERS AND PRINTERS

BACKGROUND

5 1. Field of the Invention.

The invention is related to colored lenses for enabling the user to view 3D pictures.

2. Description of the Related Art.

3D stereoscopy has been known for over a hundred years. Well-
10 known examples of 3D stereoscopy in popular use include the VIEW
MASTER reels and 3D movies of the 1950s and later. However, since the
arrival of personal computers and color inkjet printers, there has been no 3D
viewer filters designed for pictures produced by them. The color spectra seen
by viewing a picture printed by an inkjet printer can be different from the color
15 spectra seen by viewing a picture made using the standard chemical
photographic process. The red/cyan viewers available for red/cyan
photographs do not result in clean, ghost-free images. What is needed,
therefore, are filters designed and optimized for viewing 3D photos printed on
home computer inkjet printers.

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SUMMARY

Optical filters that are designed and optimized for viewing 3D photos
printed on home computer inkjet printers have a red filter having a

transmittance of greater than 60% with 610 nm and greater wavelength light, and a cyan colored filter having a transmittance peak of greater than 60% with 480 nm wavelength light and a transmittance of greater than 50% with 700 nm and greater wavelength light. These and other features and embodiments of the invention will be made clear in the following drawings, description, and claims.

DRAWINGS

Fig. 1 is a graph of percent transmittance plotted against wavelength for the red lens.

Fig. 2 is a graph of percent transmittance plotted against wavelength for the cyan/blue lens.

DESCRIPTION

The invention is a pair of optical filters that are designed and optimized for viewing 3D photos printed on home computer inkjet printers. The pair has a red colored filter having a transmittance of greater than 60% with 610 nm and greater wavelength light, and a cyan colored filter having a transmittance peak of greater than 60% with 480 nm wavelength light and a transmittance of greater than 50% with 700 nm and greater wavelength light.

The filters result in clear, ghost-free, sharp images that are likely to greatly increase acceptance of anaglyph 3D viewing. The characteristics of

the filters are best described by the following tables of information. The transmittance values are +/-5%.

Red Lens Specifications:

5	Luminous Transmittance (Tv) :	13.8786650 %
	Filter Category :	3
	MAX Tf 260nm-315nm :	(<0.1Tv) 0.000 => PASS
	MAX Tf 315nm-350nm :	(<0.5Tv) 0.000 => PASS
	MAX TSUVA 315nm-380nm :	(<0.Tv) 0.00000 => PASS
10	Min Tv 500nm-650nm :	(>0.2Tv) 0.000 => FAIL

UV Transmittance:

TSUVA (<0.00000+0.5) :	0.00000 => PASS
TSUVB (<0.00000+0.5) :	0.00000 => PASS

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Blue Light Transmittance:

Tsb 380nm-500nm (<0.00000+0.5) :	0.00000 => -Reference-
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Recognition of signal lights:

20	Red (Q) Factor (>0.8) :	5.101 => PASS
	Yellow (Q) Factor (>0.8) :	2.320 => PASS
	Green (Q) Factor (>0.6) :	0.120 => FAIL
	Blue (Q) Factor (>0.4) :	0.715 => PASS

Table 1

WL (nm)	T%	WL (nm)	T%	WL (nm)	T%	WL (nm)	T%	WL (nm)	T%
780	91.903	770	92.161	760	92.448	750	92.722	740	92.917
730	92.717	720	92.326	710	91.811	700	91.462	690	91.345
680	91.542	670	91.612	660	81.412	650	90.614	640	89.146
630	86.667	620	81.662	610	69.871	600	46.158	590	16.359
580	1.864	570	0.047	560	0.000	550	0.000	540	0.000
530	0.000	520	0.000	510	0.000	500	0.000	490	0.000
480	0.000	470	0.000	460	0.000	450	0.000	440	0.000
430	0.000	420	0.000	410	0.000	400	0.000	390	0.000
380	0.000	370	0.000	360	0.000	350	0.000	340	0.000
330	0.000	320	0.000	310	0.000	300	0.000	290	0.000
280	0.000								

These data are plotted as the curve 10 of Fig. 1.

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Cyan (Blue) Lens Specifications:

Luminous Transmittance (Tv) : 20.3037224 %

Filter Category: 2

MAX Tf 260nm-315nm : (<0.1Tv) 0.000 => PASS

10 MAX Tf 315nm-350nm : (<0.5Tv) 0.000 => PASS

MAX TSUVA 315nm-380nm : (<0.Tv) 0.00000 => PASS

Min Tv 500nm-650nm : (>0.2Tv) 0.000 => FAIL

UV Transmittance:

15 TSUVA (<0.00000+0.5) : 0.00000 => PASS

TSUVB (<0.00000+0.5) : 0.00000 => PASS

Blue Light Transmittance:

Tsb 380nm-500nm ($<31.98323+0.5$) : 40.1871 \Rightarrow -Reference-

Recognition of signal lights:

- 5 Red (Q) Factor (>0.8) : 0.175 \Rightarrow FAIL
 Yellow (Q) Factor (>0.8) : 0.346 \Rightarrow FAIL
 Green (Q) Factor (>0.6) : 1.413 \Rightarrow PASS
 Blue (Q) Factor (>0.4) : 1.930 \Rightarrow PASS

10 Table 2

WL (nm)	T%	WL (nm)	T%	WL (nm)	T%	WL (nm)	T%	WL (nm)	T%
780	92.144	770	91.478	760	90.844	750	90.296	740	89.580
730	87.446	720	82.453	710	72.361	700	56.497	690	37.370
680	20.510	670	9.744	660	4.616	650	2.657	640	2.128
630	2.260	620	2.539	610	2.574	600	2.617	590	3.287
580	5.182	570	0.262	560	11.744	550	15.936	540	22.629
530	31.805	520	40.710	510	48.506	500	56.496	490	62.925
480	64.320	470	60.939	460	54.323	450	43.995	440	31.496
430	21.451	420	14.386	410	5.358	400	0.115	390	0.000
380	0.000	370	0.000	360	0.000	350	0.000	340	0.000
330	0.000	320	0.000	310	0.000	300	0.000	290	0.000
280	0.000								

These data are plotted as the curves of Fig. 2. As is shown in Table 2 and Fig. 2, the blue/cyan colored lens has a transmittance peak 12 of greater than 60% with 480 nm wavelength light. It is also shown that the transmittance 14 exceeds 50% with 700 nm and greater wavelength light.

While there have been described what are at present considered to be the preferred embodiments of this invention, it will be obvious to those skilled

in the art that various changes and modifications may be made therein without departing from the invention and it is, therefore, aimed to cover all such changes and modifications as fall within the true spirit and scope of the invention.